



(19)

(11) Publication number:

5

Generated Document.

## PATENT ABSTRACTS OF JAPAN

(21) Application number: **53061495**(51) Int'l. Cl.: **H01L 21/22 H01L 21/324**(22) Application date: **22.05.78**

(30) Priority:

(43) Date of application  
publication: **30.11.79**(84) Designated contracting  
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**(54) PREVENTING METHOD  
FOR OCCURRENCE OF  
CRYSTAL DEFECT OF  
SILICON SINGLE-CRYSTAL  
SUBSTRATE**

(57) Abstract:

**PURPOSE:** To prevent the occurrence of a crystal defect by forming diffusion strain by diffusing atoms, different in atom radius of Si, to the circumference of the other main surface of a Si single-crystal substrate in a belt shape.

**CONSTITUTION:** On the top and reverse surfaces of a Si single-crystal substrate, oxidized films 2 and 3 are formed. In oxidized film 2 on a main surface other than a surface where a semiconductor element is to be formed, two opening parts 4 and 5 of approximately 250µm in width are concentrically formed, at an interval of approximately 50µm, approximately 4mm away inward from the external circumference. Through opening parts 4 and 5, atoms, differing in atom radius from Si, such as Sb atoms are

thermally diffused to a surface density of  $10^{19}/\text{cm}^3$  and a depth of  $5\mu\text{m}$  approximately so as to form diffusion regions 6 and 7. In consequence, diffusion strain is generated in the Si substrate. Then, oxidized films 2 and 3 are removed. The substrate formed by the above method is oxidized for about thirty minutes in a vapor atmosphere of  $1140^\circ\text{C}$ . Consequently, a region without strip lines is expanded to a degree of 90%, so that great improvement can be realized.

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